Amendments to the Specification:

Please amend the specification as follows:

1) Please amend the paragraph beginning on page 17, line 27, to read as follows:

This input test sequence is fed through a buffer from a digital signal generator 10 and into the CUT 12. Connected to the output of the CUT is a comparator 16 for comparing the CUT output signal with an optimized ~~optimised~~ threshold 22. The comparator 16 is in turn connected to processor 18 that has access to a memory 20 in which are stored the reference outputs for a fault free version of the CUT, as well as reference outputs for circuits with known faults. Whilst not shown on Figure 1, it will be appreciated that the system must be synchronized ~~synchronised~~ to a master clock so that testing is performed with synchronized ~~synchronised~~ input/output binary sequences. In addition, the comparator output must be digitized ~~digitised~~ faster than the clock speed of the input sequence for precise recording of the zero crossings.

2) Please amend the paragraph beginning on page 18, line 7 to read as follows:

When a circuit is to be tested, the digital test signal 14 is applied to it. The resulting output signal 24 from the CUT is analogue. This is passed to the comparator 16 for processing. The comparator 16 in effect reduces the analogue response 24 of the CUT 12 to threshold crossings recorded against time. The output 28 of the comparator 16 is either logic high or logic low depending upon the result of comparison between the CUT response and the comparator 16 threshold and so is a binary sequence of 0s and 1s that is indicative of the digital response of the circuit. Examples of (i) analogue responses from the CUT and (ii) the corresponding one-bit quantized ~~quantised~~ responses from the comparator 16 are shown in Figures 2(a) and (b).

3) Please amend the paragraph beginning on page 18, line 20 to read as follows:

The binary signal output 28 from the comparator 16 is then passed to the processor 18 for comparing it with the stored reference binary sequence for a substantially fault free CUT, 20. More specifically, the two binary signals are compared and the Hamming distance 26 between

them is calculated. The Hamming distance 26 between two binary sequences is the number of digits in one of the two sequences that have to be changed to make it the same as the other. This task may be alternatively accomplished using combinational logic circuitry.

4) Please amend the paragraph beginning on page 18, line 30, to read as follows:

In the event that the output from the test circuit and the stored sequence are the same, within a pre-determined limit, i.e. the Hamming distance 26 is substantially zero, this indicates that the circuit is acceptable. In contrast, should the output 28 and the stored sequence 20 be different, i.e. should the Hamming distance 26 be non-zero, this indicates that the tested CUT is faulty. In this event, an alarm is raised and the circuit is designated as being faulty. Hence, by means of a one-bit quantization ~~quantisation~~, a straightforward, cost effective and fast means of detecting faults is provided. It should be noted that in practice, differences in some timeslots due to component tolerances are non-diagnostic and are excluded from the evaluation. This will be discussed in more detail later.

5) Please amend the paragraph beginning on page 23, line 4, to read as follows:

The arrangement of Figure 4 includes an input 22 for receiving a signal from a good CUT, an input 24 for receiving a signal from a faulty CUT and a comparator 26. The comparator 26 threshold level is a DC voltage, based on which a comparison is made. During calculation of the figure of merit in the optimization ~~optimisation~~ procedure of the test development mode, multiple values for the comparator threshold are used and the one which yields highest figure of merit is selected. The comparator 26 threshold level is subtracted from each of the input signals at respective summers 28 and 30. If $x_0(t)$ is the nominal analogue response for the good CUT and Comp is the comparator threshold level, the signal of interest is the difference between them. This difference ($x_0(t)$ - Comp) indicates whether $x_0(t)$ is greater than *Comp* or not.

6) Please amend the paragraph beginning on page 25, line 9, to read as follows:

After being acted on by the sigmoidal function, the signals are then multiplied together at a multiplier stage 36. The product of the two signals is then acted on by a tolerance confidence function to take into account tolerances in the CUTS. In the present case, the tolerance confidence function is multiplied at 38 with the in-coming signal.

7) Please amend the paragraph beginning on page 27, line 8, to read as follows:

Figure 9 shows an arrangement for determining a figure of merit for an input signal to detect faults in a CUT. As for Figure 4, this is a diagrammatic representation of methodology that is implemented in software. In the methodology of Figure 9, the input signal is passed through a good CUT 90 to provide an ideal response and likewise through each of a plurality of modelled faulty circuits, each of the modelled faulty circuits having a known but different fault or combination of faults. The selection of the faults to test for depends on the nature of the CUT and the components used in it. Each of the resultant signals for the faulty CUTs is then processed as described with reference to Figure 4 to provide a value D_i that is a measure of the difference between the response of a faulty circuit [I] 92_I and the response of a good circuit 90. The output of the differencing 94_I is then acted on by a sigmoidal function 96_I, to prevent any given fault from dominating the overall figure of merit, to produce a figure of merit for each faulty CUT 92_I. As before, any reasonable input-output function can be employed for this, the requirements being that the output should saturate at two different predetermined values for extreme values of input. In between these saturation regions, the function should preferably increase monotonically, and hence be single-valued. The hyperbolic tangent has worked well but other functions might be equally suitable. These figures of merit are then summed and divided by the number of modelled faulty CUTs at 98, thereby to provide a composite figure of merit.